

Pacific Northwest Carton Data

This section summarizes carton data from the findings of several studies completed in the PNW. Studies include those conducted for the City of Seattle, University of Washington, Washington State, State of Oregon, as well as an analysis of existing data to estimate the current recycling composition in the State of Oregon. *Material types* are presented in italics, and individual study definitions are listed in Appendix A. Definitions.

City of Seattle

Carton data from Seattle is derived from two waste characterization studies: the 2015 Residential Recycling Stream Composition Study and the 2014 Residential Waste Stream Composition Study. The 2015 study included a total of 270 back-of-truck samples (177 single-family and 93 multifamily) collected every other month throughout the calendar year. The 2014 study included a total of 362 samples of the residential waste stream collected every other month throughout the calendar year. In 2014, samples were split equally between single-family and multifamily residential loads. The calculated capture rates and carton composition are listed below.

- ▶ The capture rates for *polycoated containers* and *aseptic containers* combined are:
 - Single-family: 54%
 - Multifamily: 48%
- ▶ The following table shows the composition of waste and recycling streams and average per-household generation in the City of Seattle:

Stream	Sector	Material	Annual Tons	Composition	Error Range (+/-)	Average LBS LBS/HH/YR ¹
Recycling	Single-family	Polycoated Containers	277	0.5%	<0.1%	3.91
		Aseptic Containers	132	0.2%	<0.1%	1.86
	Multifamily	Polycoated Containers	113	0.4%	<0.1%	1.59
		Aseptic Containers	56	0.2%	<0.1%	0.79
Disposed	Single-family	Polycoated Containers	350	0.6%	0.4%	4.94
	Multifamily	Polycoated Containers	183	0.4%	0.1%	2.58

¹ Average household generation rates throughout the document are based on household data from the 2010/2020 Census. We assume that 50% of total households are single-family, and 50% are multifamily.

University of Washington

In January and February 2018, Cascadia completed a waste characterization study for the University of Washington. The study included 229 samples of garbage, 120 samples of recycling, and 120 samples of compost from campus. Below is the capture rate and composition data for each stream.

▶ The following table shows the composition of each stream and the average student generation:

Stream	Material	Annual Tons	Composition	Error Range (+/-)	Average LBS/Student/YR
Overall		34.2	0.5%	0.1%	1.48
Disposed	Polycoated/aseptic packaging	10.8	0.3%	<0.1%	0.47
Recycling		20.8	2.1%	0.5%	0.90
Compost		2.6	0.2%	0.1%	0.11

▶ Below are capture rates for *polycoated/aseptic packaging* and other common recyclables for comparison.

Material	Capture Rate
Polycoated/aseptic packaging	62%
PET bottles & containers	64%
Aluminum cans	68%
High-grade paper	47%

Washington State (Rural Counties)

In 2015-2016, Cascadia completed a four-season characterization study of municipal solid waste disposed in Washington State. The study included 243 commercial samples, 122 residential samples, and 120 self-haul samples (excluding C&D) from 10 counties across the state². The data is predominantly from rural parts of the state and excludes metropolitan areas such as City of Seattle. Below are the average per-household generation rates and the composition of cartons in the disposed waste stream. Please note that this data does not include the recycling stream.

The following table shows the carton composition in the waste stream and the average generation of *aseptic & polycoated containers* in the residential sector:

Stream	Sector	Material	Annual Tons	Composition	Error Range (+/-)	Average LBS/HH/YR ³
Disposed	Overall		10,552	0.2%	0.1%	-
	Commercial	Aseptic & Polycoated Packaging	7,380	0.4%	0.3%	-
	Residential ⁴		2,600	0.2%	<0.1%	3.43
	Self-haul (excl. C&D)		555	0.1%	0.1%	-
	Self-haul C&D		16	0.0%	0.0%	-

² This study includes data from the following Washington State counties: Chelan, Clallam, Cowlitz, Franklin, Grant, Grays Harbor, Kitsap, Lewis, Skagit, and Spokane.

³ LSB/HH/YR is the average generation for households located within the 10 counties included in this study.

⁴ Residential includes waste from both single-family and multifamily households.

Oregon State

Composition of Comingled Recyclables (2009-2010)

In 2009, Oregon Department of Quality (DEQ) completed a study of the composition of commingled recyclable materials received by processing facilities in the state, as well as the composition and contamination levels of major commodities sorted and marketed for recycling.

- ▶ This study found that paper beverage cartons also were inconsistently sorted, with many ending up with newspaper or other incompatible grades of paper.⁵
- ▶ The following table shows the composition of *gable top beverage containers* and *aseptic drink cartons* in the incoming recycling stream in Oregon in 2009:

Stream	Sector	Material	Composition	Error Range (+/-)
Recycling	Overall	Gable Top	0.3%	0.04%
		Aseptic	0.03%	0.01%
	Residential	Gable Top	0.42%	0.1%
		Aseptic	0.04%	0.02%
	Commercial	Gable Top	0.09%	0.06%
		Aseptic	0.02%	0.01%

Oregon Solid Waste Characterization Study (2016)

In 2016, DEQ completed a statewide study of the composition of solid waste which included collecting and sorting 974 samples at disposal facilities. The final report has not yet been released, but preliminary data is available on DEQ’s website. The full study results are expected to include material and stream definitions as well as additional context about the study.

- ▶ The following table shows preliminary results from the 2016 statewide waste characterization:

Stream	Sector	Material	Annual Tons ⁶	Composition	Error Range (+/-)
Disposed	Overall	Gable Top (milk) Cartons	1,190	0.04%	0.01%
		Aseptic drink boxes	890	0.03%	0.01%
	Residential	Gable Top (milk) Cartons	470	0.06%	0.02%
		Aseptic drink boxes	291	0.04%	0.01%
	Commercial	Gable Top (milk) Cartons	226	0.07%	0.04%
		Aseptic drink boxes	253	.07%	0.03%

⁵ Oregon Department of Environmental Quality. “Composition of Commingled Recyclables Before and After Processing.” March 2011. Page 2.

⁶ Annual tons are published as “Clean Annual Tons”. These tons include a correction factor for contamination.